

PRELIMINARY OWNER/OPERATOR'S MANUAL

GAPLUS

PRELIMINARY

MIDWAY MFG. CO.

10601 W. Belmont Avenue
Franklin Park, Illinois 60131
U.S.A.



Phone: (312) 451-9200 Cable Address: MIDCO Telex No.: 72-1596

WARNING
**THIS GAME MUST BE GROUNDED. FAILURE TO DO SO MAY
RESULT IN DESTRUCTION TO ELECTRONIC COMPONENTS.**

WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not used in accordance with the instructions manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a CLASS A computing device pursuant to SUBPART J of PART 15 of FCC RULES, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take whatever measures may be required to correct the interference.

ELECTRICAL BULLETIN: FOR ALL APPARATUS COVERED BY THE CANADIAN STANDARDS ASSOCIATION (CSA) STANDARD C22.2 NO. 1, WHICH EMPLOYS A SUPPLY CORD TERMINATED WITH A POLARIZED 2-PRONG ATTACHMENT PLUG.

CAUTION: TO PREVENT ELECTRIC SHOCK DO NOT USE THIS (POLARIZED) PLUG WITH AN EXTENSION CORD, RECEPTACLE OR OTHER OUTLET UNLESS THE BLADES CAN BE FULLY INSERTED TO PREVENT BLADE EXPOSURE.

ATTENTION: POUR PREVENIR CHOCS ELECTRIQUES NE PAS UTILISER CETTE FICHE POLARISEE AVEC UN PROLONGATEUR, UNE PRISE DE COURANT OU UNE AUTRE SORTIE DE COURANT, SAUF SI LES LAMES PEUVENT ETRE INSEREES A FOND SANS EN LAISSER AUCUNE PARTIE A DECOUVERT.

Bally MIDWAY™

Invites You To Use

**OUR TOLL FREE NUMBERS FOR
SERVICE INFORMATION CONCERNING THIS GAME, OR ANY
OTHER BALLY MIDWAY GAME YOU NOW HAVE ON LOCATION.**

**CALL US FOR PROMPT, COURTEOUS
ANSWERS TO YOUR PROBLEMS.**

VIDEO —► Continental U.S. 1-800-323-7182

PINBALL —► Continental U.S. 1-800-323-3555

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Printed in U.S.A.

PRELIMINARY INSTRUCTIONS
FOR
GAPLUS

INSTALLATION

1. Unlock and open the coin box door.
2. Remove four (4) "CABINET LEVELING LEGS" from inside the coin box.
3. Tip the cabinet to the side and remove the shipping cleats from its bottom.
 - ° Locate the threaded holes - one in each corner - and install the "CABINET LEVELING LEGS" in them.
 - ° Level the cabinet.
 - ° When finished, the cabinet should be stable in the upright position.
4. Close and lock the rear access door and plug the game into a **standard A.C. wall outlet ONLY.**

-----**WARNING**-----
Game **MUST** be
properly grounded.

LINE VOLTAGE SAFETY INTERLOCK SWITCHES

Line voltage SAFETY INTERLOCK SWITCHES have been provided for your protection. The locations of these SAFETY INTERLOCK SWITCHES are:

1. UPRIGHT MODEL: Inside the rear of the cabinet at the side of the rear access door.

When the cabinet access door(s) are secured in place, the SAFETY INTERLOCK SWITCH plunger(s) are in a fully depressed condition. The game circuit can function normally.

When any cabinet access door(s) are opened, the SAFETY INTERLOCK SWITCH plunger(s) are in a partially extended condition. This isolates the game circuit from the line voltage.

To restore power to the game circuit with the access door(s) open, gently pull the SAFETY INTERLOCK SWITCH plunger(s) out to the fully extended condition. **THIS IS TO BE USED FOR SERVICING THE GAME ONLY!**

SELF-TEST

A slide switch is provided to make the game run a "Self-Test" on itself. The SELF-TEST SWITCH is located on a mounting bracket just inside the coin door opening.

When in the Self-Test mode, the monitor screen will display the results of certain test functions it has run on itself.

TO SERVICE THE CONTROL PANEL

1. UPRIGHT MODEL:

- ° The control panel is held in place by three latches, one on the left side, one on the right side, and one in the center of the front of the cabinet.

They are spring loaded to provide constant positive pressure on their latch plates.

They can be reached through the coin door AFTER turning power to the game off.

To release the latches, lift up and toward the center of the control panel.

Once they are released, unhook them from their latch plates.

- ° To remove the control panel:

Cradling the control panel between yourself and the cabinet, disconnect it from its cabling and any miscellaneous hardware.

The control panel is now free and can be removed.

- ° To reinstall the control panel, reverse this procedure.

REMOVAL OF THE MAIN-DISPLAY-GLASS AND/OR THE T.V. BEZEL ASSEMBLY

1. UPRIGHT MODEL:

NOTE: In order to do this, the control panel **MUST** be removed first. See the "UPRIGHT MODEL" procedure.

- ° Turn the power to the game off and remove the control panel. This frees the main-display-glass so it can be lifted up.
- ° By putting your finger in the hole in the middle of the main-display-glass support, you can lift it up and out.
- ° Loosen the screws which secure the T.V. bezel-glass-clamps in place.

Move the clamps to the side and the bezel glass may be removed.

Remove the bezel securing screws and the bezel with four bezel-glass-clamps may be removed.

- ° To reinstall the T.V. bezel assembly and the main-display-glass, reverse this procedure.

VOLUME CONTROL POT

The volume control pot is located on the games Logic P.C. Board in the back of the game cabinet. For adjustment, it may be reached through the games rear access door.

To make the sounds louder, turn the pot clockwise as you face it.

To make the sounds less loud, turn the pot counterclockwise as you face it.

CAUTION

- ° Be sure to check the PC Board for any foreign particles i.e. dust, etc.. Foreign particles on the PC Board are one of the main causes of the PC Board malfunctions.
- ° When in doubt as to the cause of any particular problem, **ALWAYS** take the PC Board to your distributor for repair. DO NOT attempt to repair the PC Board yourself by using a volt-ohm meter or other testing equipment.
- ° When transporting the PC Board, be sure to pack the board carefully with air caps, sponge or other packing materials.

PC BOARD

- ° Option Switches:

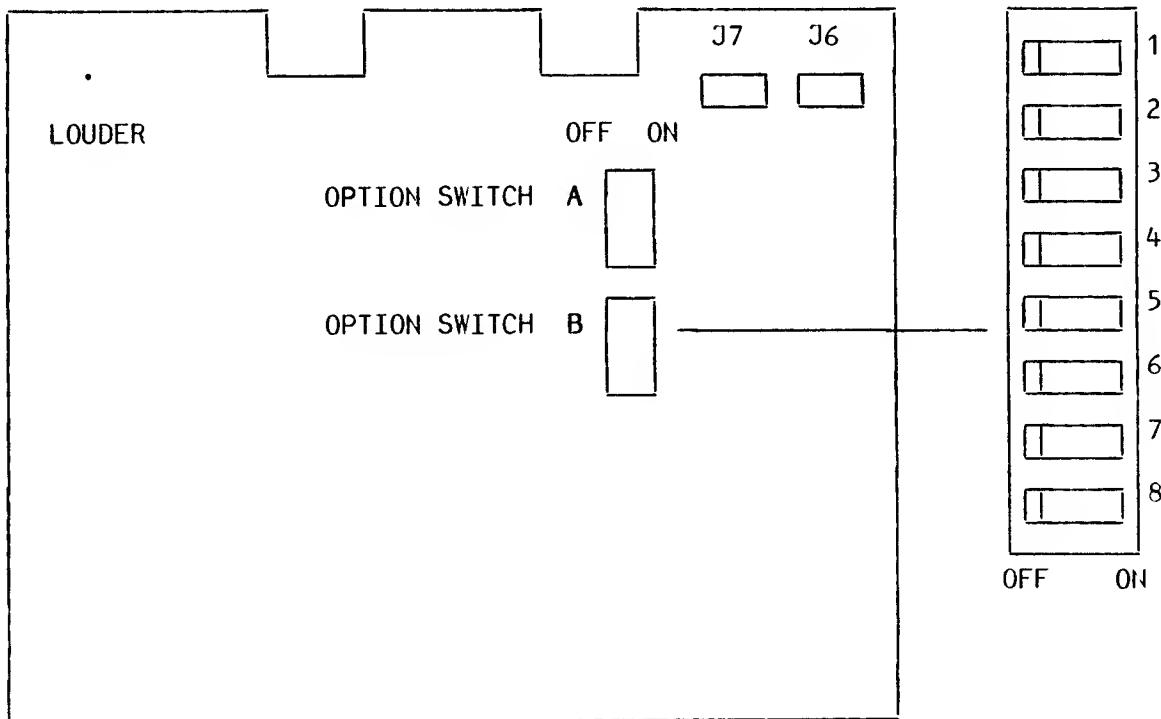
The game fee, bonus points, etc. are operator-adjustable. See the Option Switch Settings Table.

To perform the Self-Test, use the test switch located on the bracket just inside your games coin door.

- ° Volume:

Adjust the game volume as desired. DO NOT place any unnecessary pressure on the volume control knob.

J8



SELF-TEST

The Self-Test mode is a special mode for checking game switches and computer functions. It is the easiest and best way to check for proper operation of the entire game.

You may begin a Self-Test at any time after the power to the game is on by sliding the Self-Test switch to the "ON" position. Now that the game is in the Self-Test mode, it will act as follows:

- ° The Self Test will take about five (5) seconds to perform. The following check list will appear on the screen.

RAM OK	_____	A.
ROM OK	_____	B.
I/O OK	_____	C.
1ST 1 COIN 1 CREDIT	_____(COIN 1)	D.*
2ND 1 COIN 1 CREDIT	_____(COIN 2)	D.*
MYSHIP 3	_____	E.*
RANK 0	_____	F.
UPRIGHT	_____	G.
SOUND 00	_____	H.
1ST BONUS 50000 PTS	_____	I.*
2ND BONUS 150000 PTS	_____	I.*
EVERY BONUS 150000 PTS	_____	I.*

- A. RAM Test: If "OK" appears, RAM is normal.
 - B. ROM Test: If "OK" appears, ROM is normal.
 - C. I/O Test: If "OK" appears, I/O is normal.
 - D. Game Fee Indicator: If 1 coin/1 game appears, the game fee is normal.
 - E. Number of Fighters: If "3" appears, the number of Fighters is normal.
 - F. Rank: If "0" appears, rank is normal.
 - G. Table Specification: If "TABLE" appears for the Cocktail Table model and for the Upright Model, "UPRIGHT" appears, model specification is normal.
 - H. Sound Test: A sound should appear when the control lever, firing button and the start button is pushed.
 - I. Bonus Points: This game has been set for the first 50,000 points, then 150,000 points and for every 150,000 points thereafter.
- * By using the OPTION SWITCH; "D", "E", and "I" are operator-adjustable.

When finished with the Self-Test mode, slide the Self-Test switch back to the "OFF" position and normal game functions will now return to the monitor screen.

CROSS HATCH PATTERN

Turn "ON" the Self-Test switch, push the Service button, and a cross hatch pattern will appear. Push the button one more time and the Self-Test mode will appear. Use this pattern when making adjustments to the monitor.

ADJUSTING GAME FEE, BONUS POINTS, ETC.

This is accomplished by using the various switches located on the games Logic P.C. Board. See the OPTION SWITCH SETTINGS tables and switch location information in this instruction sheet.

Turn the power switch "OFF" and then proceed to set the Option Switches.

After setting the option switches, again perform the Self-Test.

The settings of these switches are only read by the game on "POWER-UP".

G A P L U S

O P T I O N S W I T C H S E T T I N G S - D I P S W I T C H "A"

//////////////////////////////VARIOUS GAME PLAY OPTIONS//////////////////////////////

NUMBER OF FIGHTERS GAME BEGINS WITH	<u>S W # 1</u> <u>S W # 2</u> <u>S W # 3</u> <u>S W # 4</u> <u>S W # 5</u> <u>S W # 6</u> <u>S W # 7</u> <u>S W # 8</u>						
*	3 FIGHTERS OFF OFF 2 FIGHTERS OFF ON 4 FIGHTERS ON OFF 5 FIGHTERS ON ON	NOT USED OFF OFF					
COIN #1 - NUMBER OF COINS PER CREDIT	<u>S W # 1</u> <u>S W # 2</u> <u>S W # 3</u> <u>S W # 4</u> <u>S W # 5</u> <u>S W # 6</u> <u>S W # 7</u> <u>S W # 8</u>						
*	1 COIN 1 CREDIT 1 COIN 2 CREDITS 2 COINS 1 CREDIT 3 COINS 1 CREDIT	OFF OFF OFF OFF ON OFF ON OFF OFF ON ON OFF					
SOUND	<u>S W # 1</u> <u>S W # 2</u> <u>S W # 3</u> <u>S W # 4</u> <u>S W # 5</u> <u>S W # 6</u> <u>S W # 7</u> <u>S W # 8</u>						
*	SOUND IN ATTRACT MODE NO SOUND IN ATTRACT MODE	OFF OFF ON OFF					
COIN #2 - NUMBER OF COINS PER CREDIT	<u>S W # 1</u> <u>S W # 2</u> <u>S W # 3</u> <u>S W # 4</u> <u>S W # 5</u> <u>S W # 6</u> <u>S W # 7</u> <u>S W # 8</u>						
*	1 COIN 1 CREDIT 1 COIN 2 CREDITS 2 COINS 1 CREDIT 3 COINS 1 CREDIT	OFF OFF OFF OFF OFF ON OFF ON OFF OFF ON ON					
* INDICATES FACTORY RECOMMENDED SETTINGS				PART NO. M051-00A87-B007			

G A P L U S

O P T I O N S W I T C H S E T T I N G S - D I P S W I T C H "B"

////////////////////////////// VARIOUS GAME PLAY OPTIONS //////////////////////////////

SELF-TEST MODE		<u>SW#1</u>	<u>SW#2</u>	<u>SW#3</u>	<u>SW#4</u>	<u>SW#5</u>	<u>SW#6</u>	<u>SW#7</u>	<u>SW#8</u>		
* NORMAL TEST		OFF ON									
"RANK" = DIFFICULTY LEVEL OF PLAY		<u>SW#1</u>	<u>SW#2</u>	<u>SW#3</u>	<u>SW#4</u>	<u>SW#5</u>	<u>SW#6</u>	<u>SW#7</u>	<u>SW#8</u>		
EASIEST LEVEL OF PLAY 1 * 0 STANDARD LEVEL OF PLAY		OFF	OFF	ON							
PROGRESSIVELY MORE DIFFICULT LEVELS OF PLAY	2	OFF	ON	OFF							
	3	OFF	ON	ON							
	4	ON	OFF	OFF							
	5	ON	OFF	ON							
	6	ON	ON	OFF							
	7	ON	ON	ON							
** ROUND ADVANCE		<u>SW#1</u>	<u>SW#2</u>	<u>SW#3</u>	<u>SW#4</u>	<u>SW#5</u>	<u>SW#6</u>	<u>SW#7</u>	<u>SW#8</u>		
* NORMAL ADVANCE		OFF ON									
BONUS SHIPS AWARDED AT:		<u>SW#1</u>	<u>SW#2</u>	<u>SW#3</u>	<u>SW#4</u>	<u>SW#5</u>	<u>SW#6</u>	<u>SW#7</u>	<u>SW#8</u>		
1st @ 100,000; 2nd @ 300,000 & every 600,000				OFF OFF OFF							
1st @ 150,000; 2nd @ 400,000				OFF OFF ON							
1st @ 150,000; 2nd @ 400,000 & every 900,000				OFF ON OFF							
1st @ 100,000; 2nd @ 300,000 & every 300,000				OFF ON ON							
1st @ 50,000; 2nd @ 200,000 & every 300,000				ON OFF OFF							
1st @ 50,000; 2nd @ 150,000 & every 600,000				ON OFF ON							
1st @ 50,000; 2nd @ 150,000 & every 300,000				ON ON OFF							
* 1st @ 30,000; 2nd @ 150,000 & every 600,000				ON ON ON							
** BY TURNING "ON" THE OPTION SWITCH WHILE "PARSEC" IS BEING INDICATED ON THE SCREEN, YOU CAN ADVANCE THROUGH THE "ROUNDS". PUSH THE ONE PLAYER CONTROL LEVER FORWARD (PLAYER NUMBER ONE UP SWITCH IS "ON") TO INDICATE THE NUMBER. THE INDICATED ROUND NUMBER WILL APPEAR ON THE MONITOR SCREEN WHEN THE OPTION SWITCH IS TURNED "OFF".											
* INDICATES FACTORY RECOMMENDED SETTINGS					PART NO. M051-00A87-B007						

THIS TAG TO BE TYPESET AND REPRODUCED IN BLACK INK ON HEAVY WHITE 8" x 11" CARD STOCK

TOLERANCE = ± 1/2"

GAME PLAY

With the eight-way joystick, maneuver your fighter and fire your missiles using the firing button to shoot down "GAPLUS".

"GAPLUS" comes in different varieties. Depending upon the variety and the flight pattern, the number of points received will vary. Also, when "GAPLUS" is in formation, the number of points received will vary. The following indicates the number of points each "GAPLUS" is worth at different times.

	When in Formation	When Attacking
(a) Queen Gaplus	100	400
(b) Ad Gaplus	100	400
(c) Cap Gaplus	100	300
(d) Lute Gaplus	100	200
(e) Zako Gaplus	100	100

Destroy all "GAPLUSES" and the round will clear. The "QUEEN GAPLUS" possesses the BLASTER HEAD. When the QUEEN GAPLUS is shot down, the Blaster Head will connect onto the player's fighter enabling it to power up!!!

° PHALANX ATTACK:

The tractor beam will swallow up the enemy and reform them to the good side as your fighter's ally. Result...multi-missle attacking capability.

° HYPER ATTACK:

Moving at lightening speed, the player's fighter will fire off missiles in the multiples of two.

° CYCLONE ATTACK:

The cyclone beam will draw in the enemy and smash them apart!!! Points received will double each time, 200, 400,... 6,400!

When throwing off his beam, the player's fighter can only move right and left. Also, when the Blaster Head is mounted onto the fighter's plane, he will become invincible.

When the Blaster Head is connected onto the Queen Gaplus and it is hit once, the Queen will change colors. You must hit it one more time to destroy the Queen.

Challenging Stage:

- ° The Challenging Stages are in Rounds 3, 8, 13, 18, During this stage, the enemy will continually fly about the screen. At the top of the screen, Gaplus will form a letter or a bar across the screen. When all the Gapluses leave the screen, the following bonus points are given.
- ° The number of Gapluses to form a letter x 100
- ° The number of Gapluses to form a bar x 200

Also, if the letters are completed, the following

- ° "B O N U S" --- Bonus points of 10,000
- ° "G A P L U S" --- Bonus points of 0 - 5,000
 - (Push the firing button to stop the rotating number located under your total score and then your grand total will appear.)
- ° "D O U B L E" --- Bonus points will double.
- ° "T R I P L E" --- Bonus points will triple.

Star Flash:

- ° A flash will appear on the screen and at the same time a star will appear attacking the player's fighter. When the star approaches the fighter, it will split up into four parts. The fighter must fire his missiles at all four parts.

"Bean Curd" (Tofu) Attack:

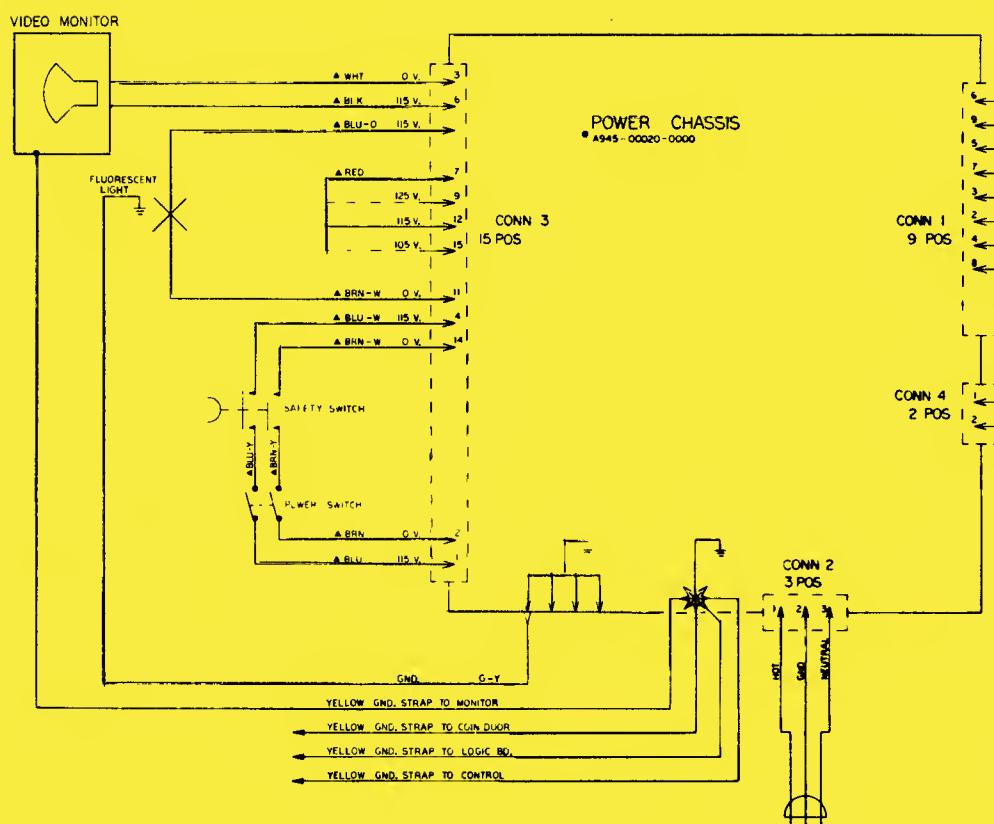
- ° When Gaplus peels off from the formation and is hit, his ghost (looking like a Bean Curd) will fall from the sky. The fighter must shoot it down.

If the player's fighter is touched by: Gaplus, missiles, star flash or the bean curd; it is a miss. The Blaster Head will disintegrate when a miss is made.

During the Phalanx Attack when Gaplus has become the fighter's ally, if Gaplus is touched by a missle or bean curd it is not a miss.

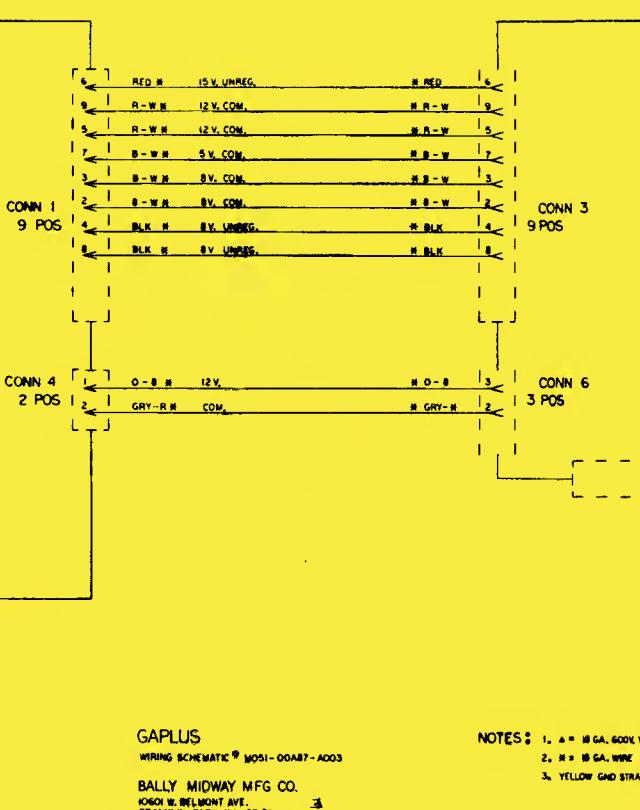
As bonus points are added up, a bonus ship will be awarded. The Queen Gaplus will bring down parts of the fighter's plane (three in all). When all three are put together, one bonus ship is added on.

The Best players to date can enter their initials on the screen by using the joystick to select a letter and then pushing the FIRE button.

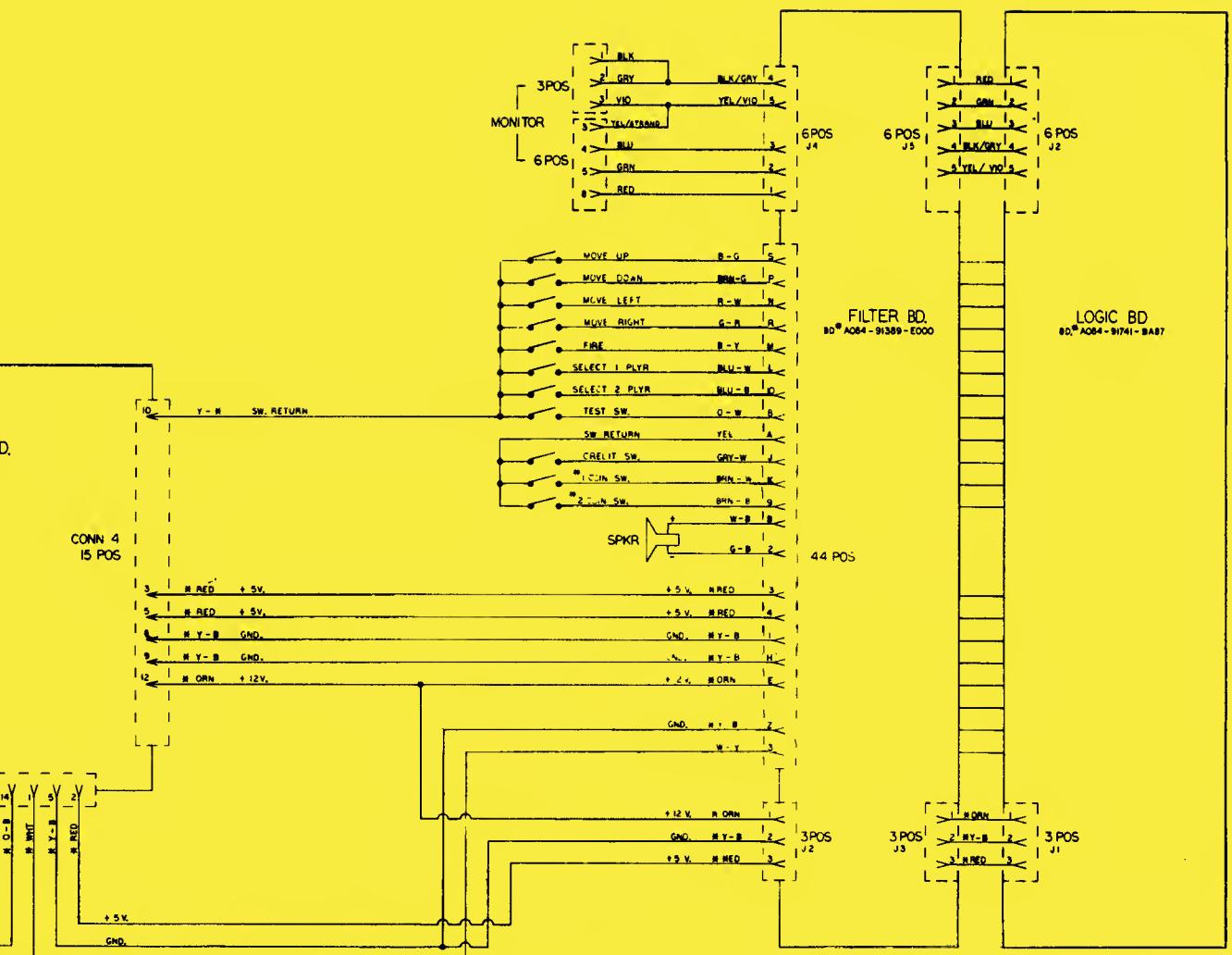
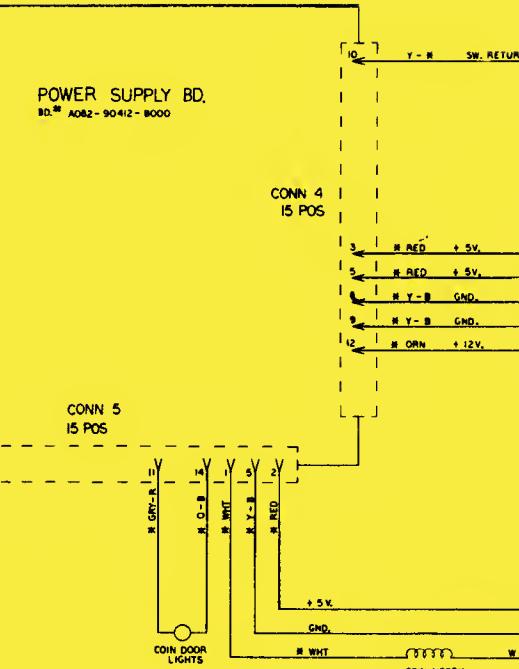


GAPL

WIRING SCHEMATIC # WO51-00AB7-A003
BALLY MIDWAY MFG CO.
10601 W. BELMONT AVE.
FRANKLIN PARK, ILL. 60131



POWER SUPPLY BD.
BD-# A082-90412-B000



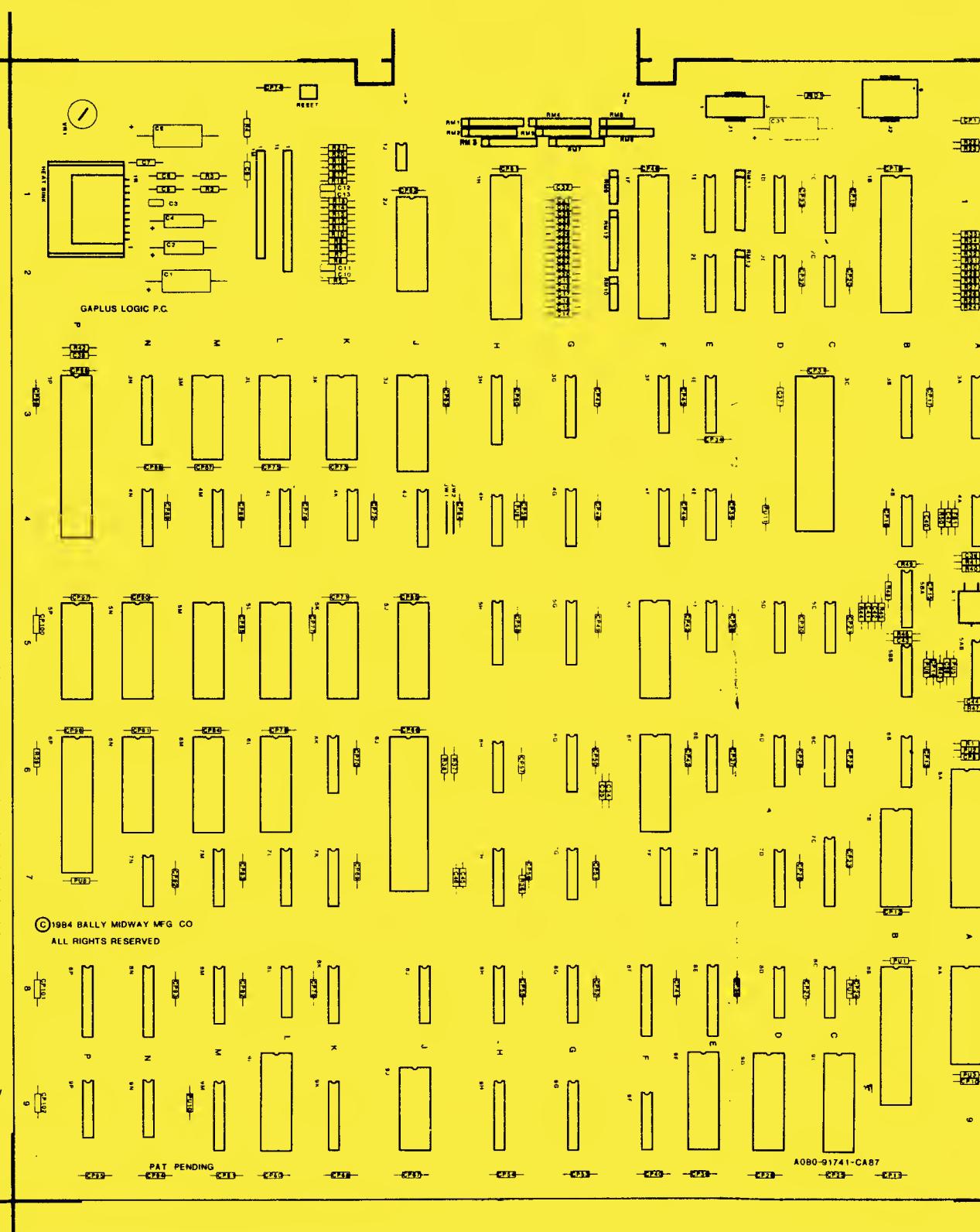
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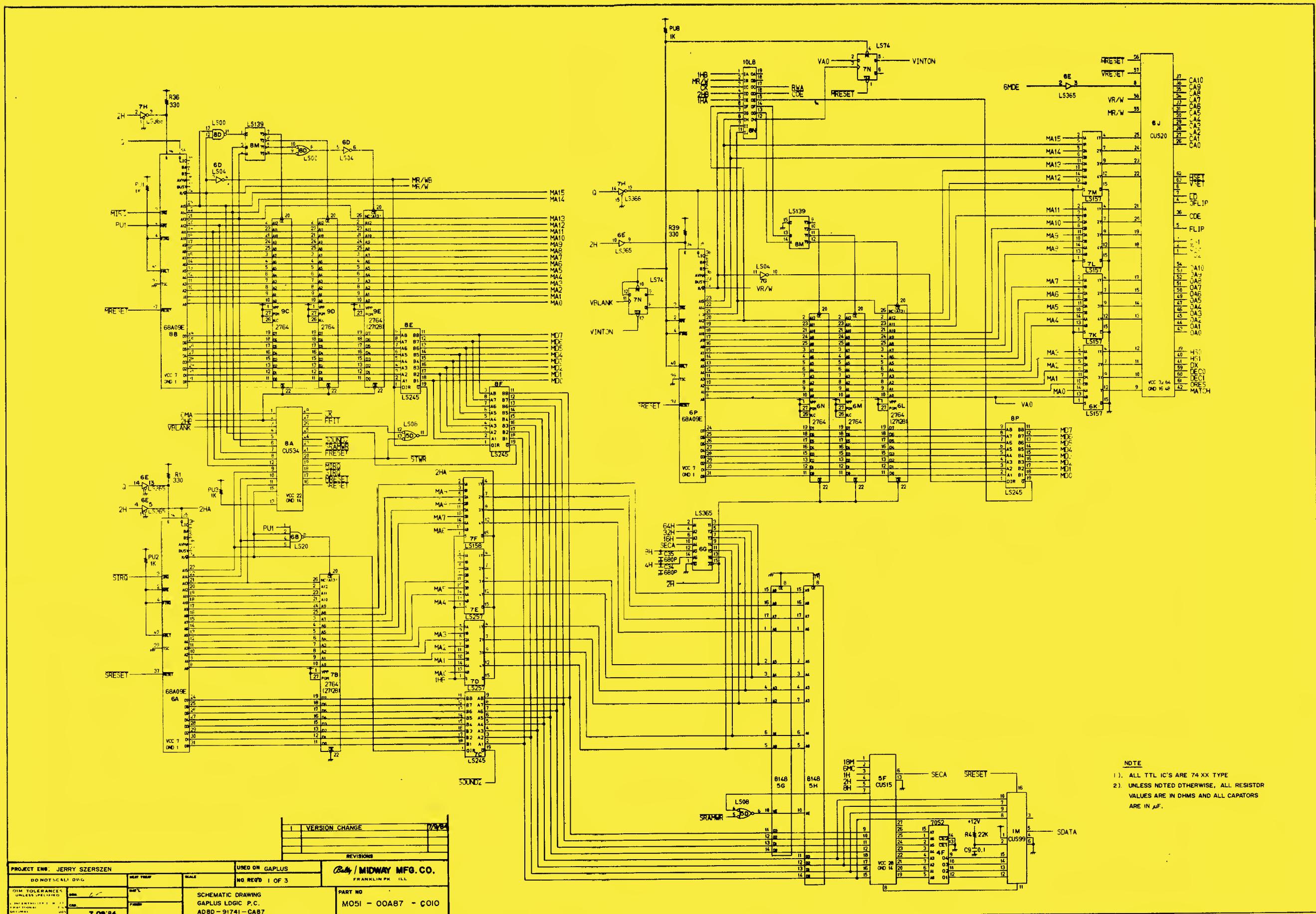
- 1. Δ = 16 GA. 600V. WIRE
- 2. \times = 16 GA. WIRE
- 3. YELLOW GND STRAP IS 300V P.V.C.

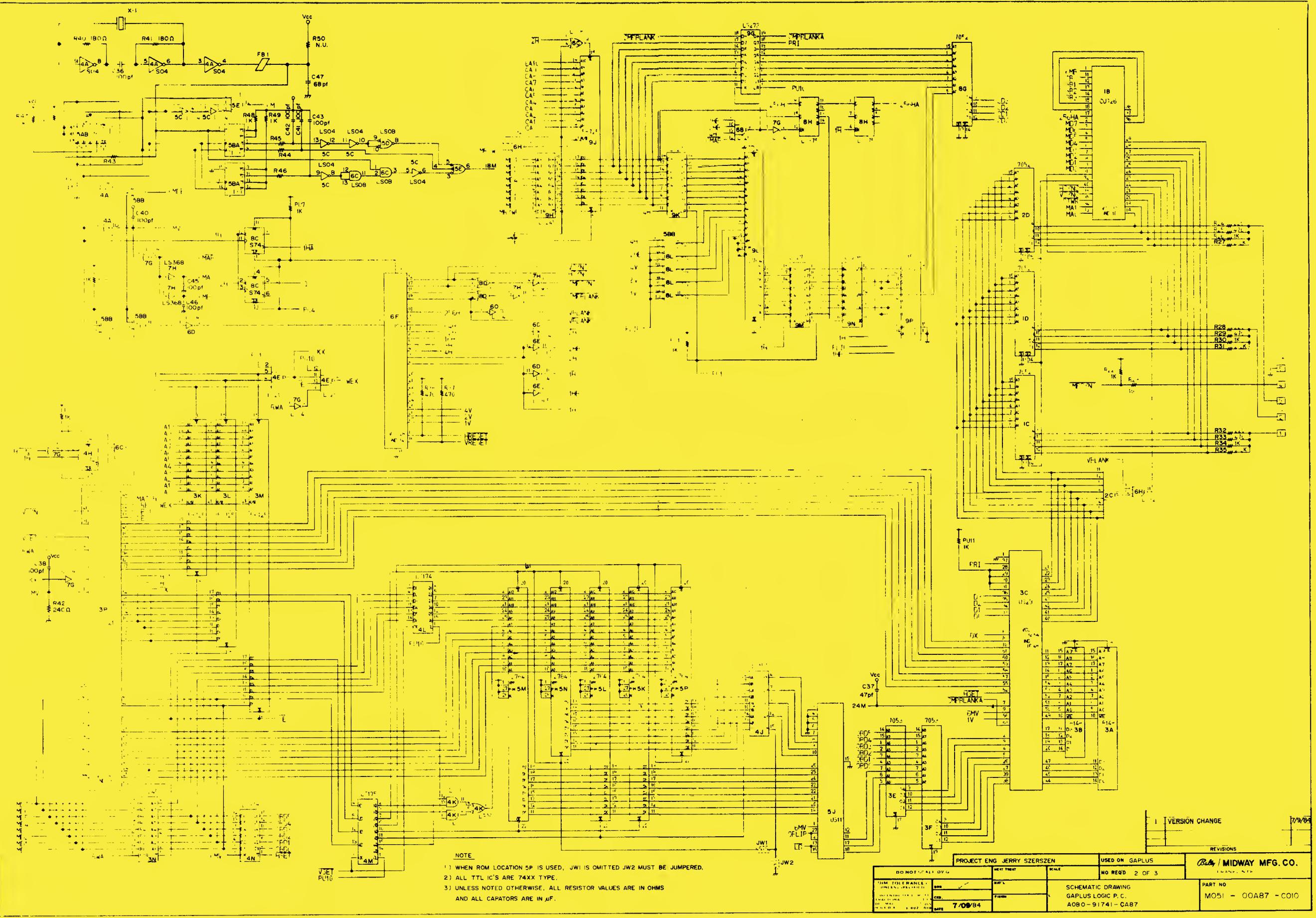
PRELIMINARY

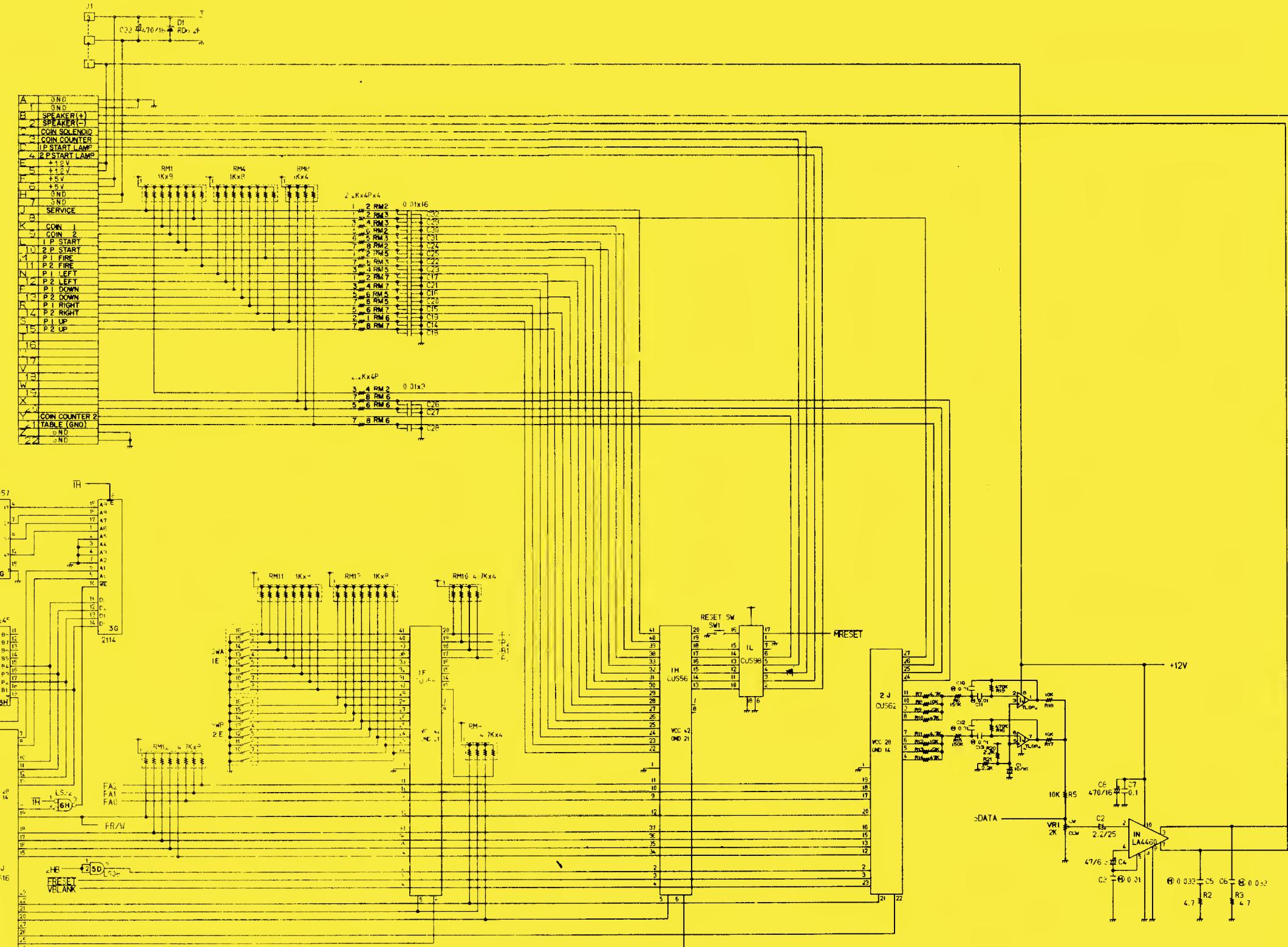
DESIGNATION LIST

DESIGNATION NO.	DESCRIPTION	DESIGNATION NO.	DESCRIPTION
C1	.1 UF AX CER	IC 5J	11XX CUSTOM IC
C2	2.2 UF AX CER	IC 5K,5L,5M,5N	ROM
C3	.01 UF AX CER	IC 5P	NOT USED
C4	.47 UF AX ELEC	IC 6A	68AD9E CPU
C5,C6	.033 UF POLY	IC 6B	74LS20
C7	.1 UF AX CER	IC 6C	74LS08
C8	.470 UF AX ELEC	IC 6D	74LS04
C9	.1 UF AX CER	IC 6E	74LS365
C10-C13	.01 UF AX POLY	IC 6F	33XX CUSTOM IC
C14-C32	.01 UF AX CER	IC 6G	74LS365
C33	.470 UF AX ELEC	IC 6H	74LS32
C34,C35	.680 UF AX CER	IC 6J	200XX CUSTOM IC
C36	.100 UF AX CER	IC 6K	74LS157
C37	.47 PF AX CER	IC 6L,6M,6N	ROM
C38-C46	.100 PF AX CER	IC 6P	68AD9E CPU
C47	.68 PF AX CER	IC 7B	ROM
CPI-CP4	.1 UF AX CER	IC 7D,7E	74LS257
CP6-CP102	.1 UF AX CER	IC 7F	74LS158
R1	330 OHM 1/4W 5%	IC 7H	74LS04
R2,R3	4.7 OHM 1/4W 5%	IC 7K,7L,7M	74LS157
R4	22K OHM 1/4W 5%	IC 7N	74LS74
R5	10K OHM 1/4W 5%	IC 8A	34XX CUSTOM IC
R6	150K OHM 1/4W 5%	IC 8B	68AD9E CPU
R7	4.7K OHM 1/4W 5%	IC 8C	74S74
R8	10K OHM 1/4W 5%	IC 8D	74LS00
R9	.2K OHM 1/4W 5%	IC 8E,BF	74LS245
R10	47K OHM 1/4W 5%	IC 8G	ROM
R11	4.7K OHM 1/4W 5%	IC 8H	74LS375
R12	10K OHM 1/4W 5%	IC 8J	NOT USED
R13	22K OHM 1/4W 5%	IC 8K	NOT USED
R14	47K OHM 1/4W 5%	IC 8L	74LS86
R15	150K OHM 1/4W 5%	IC 8M	74LS139
R16	470K OHM 1/4W 5%	IC 8N	ROM
R17,R18	10K OHM 1/4W 5%	IC 8P	74LS245
R19	470K OHM 1/4W 5%	IC 9C,9D,9E	ROM
R20,R21	2.2K OHM 1/4W 5%	IC 9F	NOT USED
R22	1K OHM 1/4W 5%	IC 9G	74LS273
R23	100 OHM 1/4W 5%	IC 9H	74LS245
R24	220 OHM 1/4W 5%	IC 9J	M58725P RAM
R25	470 OHM 1/4W 5%	IC 9K	74LS273
R26	1K OHM 1/4W 5%	IC 9L	ROM
R27	.2K OHM 1/4W 5%	IC 9M	74LS273
R28	1K OHM 1/4W 5%	IC 9N	74LS298
R29	470 OHM 1/4W 5%	IC 9P	74LS153
R30	220 OHM 1/4W 5%		
R31	2.2K OHM 1/4W 5%	ICS 1RS	40 PIN IC SOCKET
R32	1K OHM 1/4W 5%	ICS 1CS,1DS	16 PIN IC SOCKET
R33	470 OHM 1/4W 5%	ICS 1FS,1HS	42 PIN IC SOCKET
R34	220 OHM 1/4W 5%	ICS 2DS	16 PIN IC SOCKET
R35	.2K OHM 1/4W 5%	ICS 2RS	28 PIN IC SOCKET
R36	330 OHM 1/4W 5%	ICS 3AS,3BS	18 PIN IC SOCKET
R37,R38	470 OHM 1/4W 5%	ICS 3CS	64 PIN IC SOCKET
R39	330 OHM 1/4W 5%	ICS 3ES	16 PIN IC SOCKET
R40,R41	180 OHM 1/4W 5%	ICS 3JS	28 PIN IC SOCKET
R42	240 OHM 1/4W 5%	ICS 3KS,3LS,	24 PIN IC SOCKET
R43-R46	JUMPER WIRE	3MS,3PS(x2)	
R47-R49	1K OHM 1/4W 5%	ICS 4FS	16 PIN IC SOCKET
R50	NOT USED	ICS 5FS	28 PIN IC SOCKET
PUS1-PUS3	1K OHM 1/4W 5%	ICS 5GS,5HS	18 PIN IC SOCKET
PUS4-PUS11		ICS 5LS,5MS,5NS	28 PIN IC SOCKET
RK8	1K OHM 5 PIN SIP	ICS 6AS	40 PIN IC SOCKET
RK1,4,11,13	1K OHM 9 PIN SIP	ICS 6FS	28 PIN IC SOCKET
RK2,3,5,6,7	2.2K OHM 8 PIN SIP	ICS 6JS	44 PIN IC SOCKET
RK9,RM10	4.7K OHM 6 PIN SIP	ICS 6LS,6MS,	46 PIN IC SOCKET
RK12	4.7K OHM 9 PIN SIP	ICS 6PS	40 PIN IC SOCKET
IC 1,8	26XX CUSTOM IC	ICS 7AS	28 PIN IC SOCKET
IC 1,10	ROM	ICS 7BS	28 PIN IC SOCKET
IC 1,F	58XX CUSTOM IC	ICS 8BS	40 PIN IC SOCKET
IC 1,H	56XX CUSTOM IC	ICS 8MS	16 PIN IC SOCKET
IC 1,J	OP AMP TL 082	ICS 9CS,9DS	20 PIN IC SOCKET
IC 1,L	98XX CUSTOM IC	9ES	
IC 1,M	99XX CUSTOM IC	ICS 9JS	24 PIN IC SOCKET
IC 1,N	4460 AUDIO AMP	ICS 9LS	28 PIN IC SOCKET
IC 2,C	74LS30	X1	24.576 MHZ XTAL
IC 2,D	ROM		
IC 2,I	62XX CUSTOM IC		
IC 3,A,3B	M8814BL-55 RAM	1E	8 POS DIP SW
IC 3,C	29XX CUSTOM IC	2E	8 POS DIP SW
IC 3,E,3F	ROM		
IC 3,G	2114 RAM	JM1,JM2	JUMPER WIRE
IC 3,H	74LS245		
IC 3,J	16XX CUSTOM IC	J1	3 PIN AMP CONN
IC 3,K,3L,3M	M58725 RAM	J2	6 PIN AMP CONN
IC 3,N	74LS245		
IC 3,P	21XX CUSTOM IC	VR1	2K OHM POT
IC 4,A	74S04		
IC 4,B	NOT USED	D1	ZENER DIODE 6.2V
IC 4,E	74LS20		
IC 4,F	ROM		
IC 4,G	74LS157		
IC 4,H	74LS74		
IC 4,J	74LS157		
IC 4,K	74LS00		
IC 4,L	74LS174		
IC 4,M	74LS174		
IC 4,N	74LS175		
IC 5,A	74LS378		
IC 5,B	74S163		
IC 5,B	74S139		
IC 5,B	74LS86		
IC 5,C	74LS04		
IC 5,D	74LS08		
IC 5,E	74S10		
IC 5,F	15XX CUSTOM IC		
IC 5,G,SH	M8814BL-55 RAM		







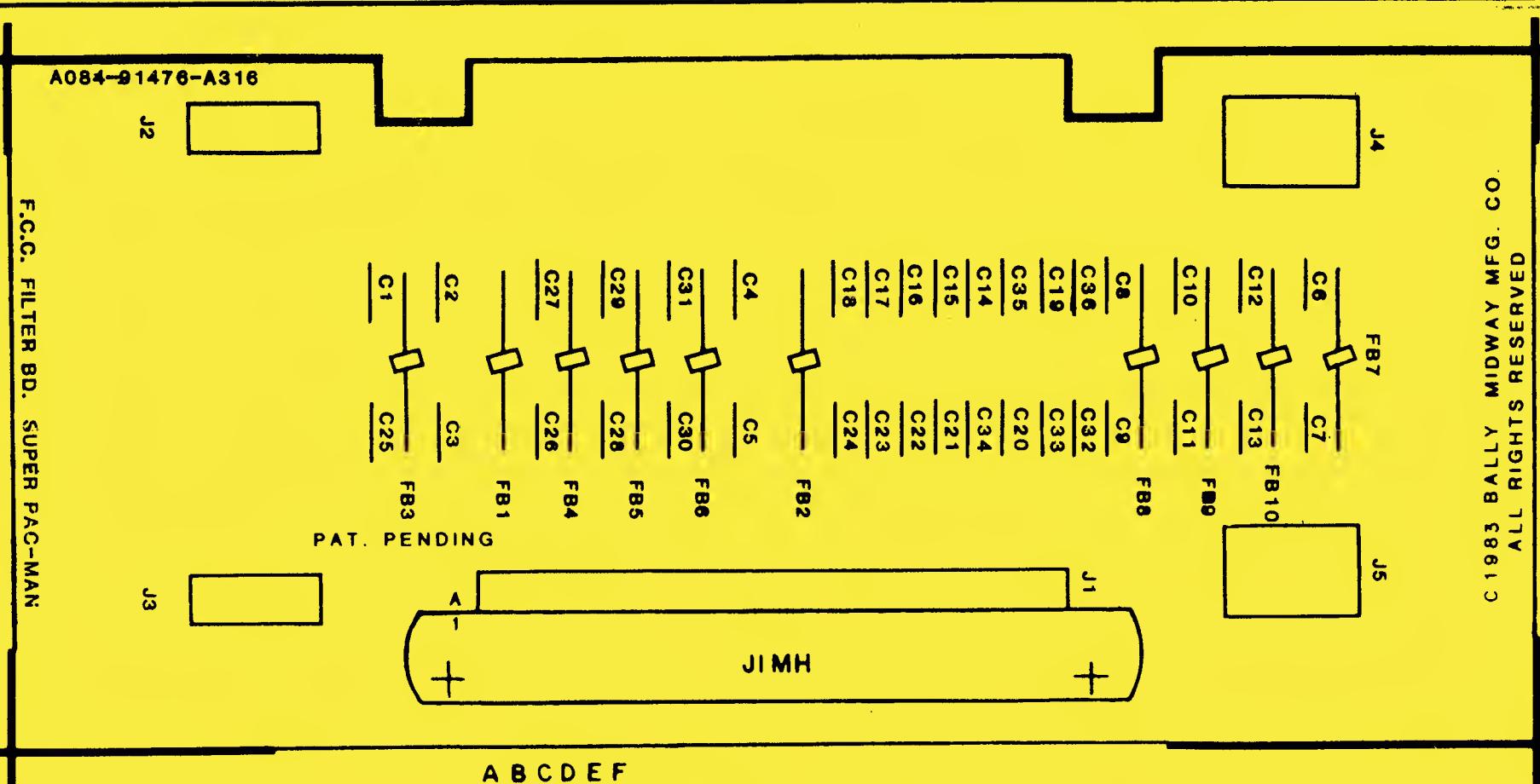


NOTE

- 1) ALL TTL IC'S ARE 74XX TYPE.
- 2) UNLESS NOTED OTHERWISE, ALL RESISTOR VALUES ARE IN OHMS AND ALL CAPACITORS ARE IN μ F.
- 3) (M) DENOTES POLYESTER FILM CAP.

PROJECT ENG: JERRY SZERSZEN		VERSION CHANE	17/9/84
DO NOT SCALE DRY		REVISIONS	
DIM TOLERANCES UNLESS SPECIFIED		REV DATE	SCALE
INCHES/MILLIMETERS		7/09/84	NO PEGD 3 OF 3
NATIONAL/		7/09/84	FRANKLIN PK, ILL
HOLTEK		7/09/84	BALLY MIDWAY MFG. CO.
MOS		7/09/84	PART NO
SCHEMATIC DRAWING		M051 - 00A87 - C010	
GAPLUS LOGIC P.C.		AO80-91741-CAB7	

<u>DESIGNATION NO.</u>	<u>DESCRIPTION</u>
C1 - C5	390pf 50V. AX. CER.
C6, C7	470pf " " "
C8 - C13	100pf " " "
C14-C24	.01μf " " "
C25	390pf " " "
C26-C29	.01μf " " "
C30, C31	390pf " " "
C32-C36	.01μf " " "
FBI-FB10	FERRITE BEAD
J1	P.C. EDGE CONN.
J2, J3	3 PIN HEADER
J4, J5	6 PIN HEADER
JIMH	(2) P.C. EDGE CONN. KEY (2) 6-32X10 SLOT PAN SCREW (2) WSH. 6 145-.250-.032 (1) BRKT.-CONN. FIN. (1) INSULATED GND. STRAP (1) 8-32X5 SLOT PAN SCREW (1) 8-32 NUT HEX
A080-91476-A316	F.C.C. FILTER BD. SUPER PAC-MAN



<u>DESCRIPTION</u>	<u>Q'TY</u>	<u>DESIGNATION NO.</u>	<u>PART NO.</u>
100pf 50V. AX. CER.	6	C8-C13	0789-00800-1800
390pf " " "	8	CI - C5, C25, C30, C31	0316-00800-0002
470pf " " "	2	C6, C7	0550-00800-0200
.01μf " " "	20	C14-C24, C26-C29, C32-C36	0550-00800-0300
FERRITE BEAD	10	FBI-FB10	0316-00804-0002
P.C. EDGE CONN	1	J1	0017-00021-0418
3 PIN HEADER	2	J2, J3	0017-00021-0443
6 PIN HEADER	2	J4, J5	0017-00021-0424
P.C. EDGE CONN. KEY	2	JIMH	0017-00021-0396
6-32X10 SLOT PAN SCREW	2	"	0017-00101-0574

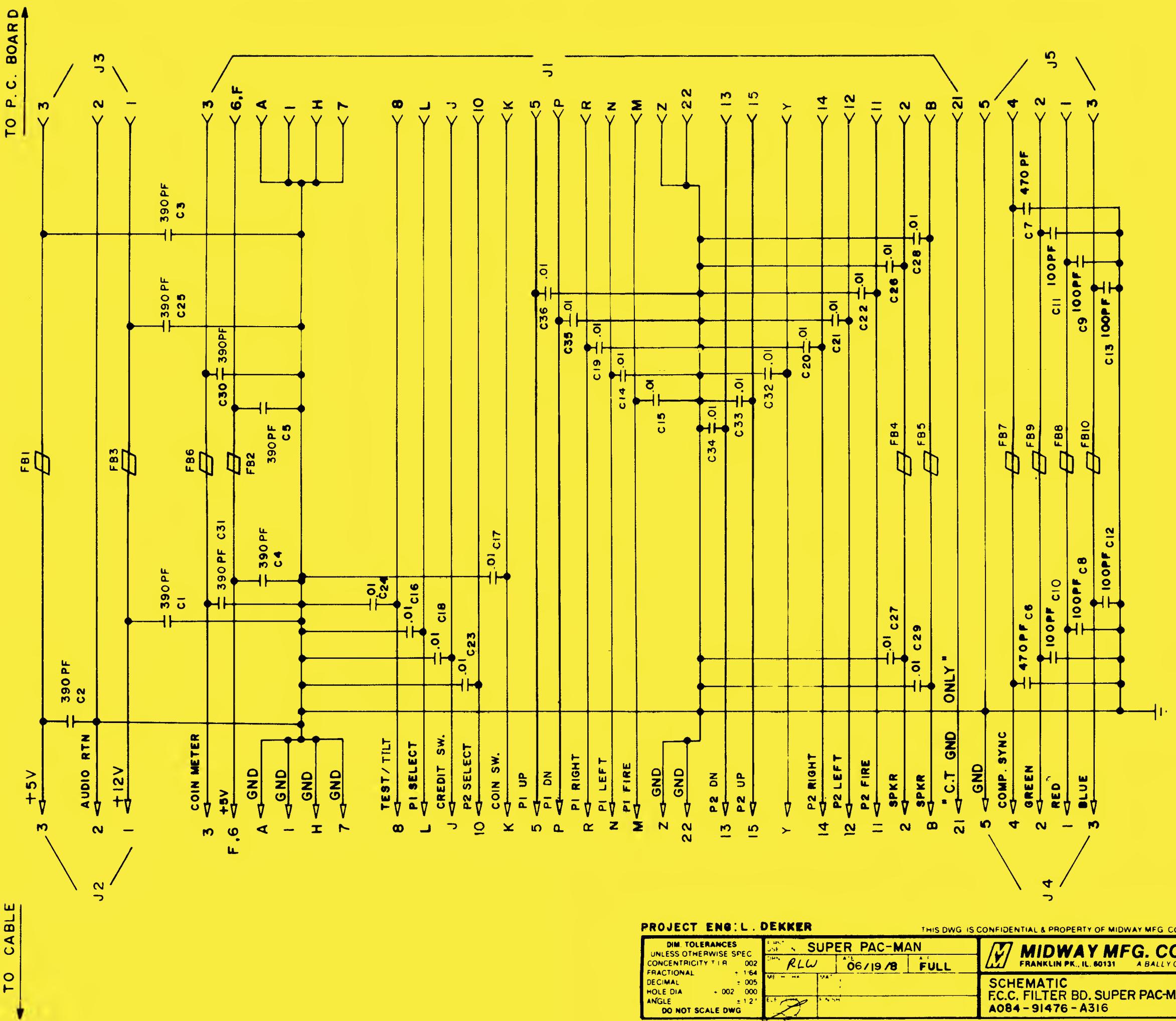
<u>DESCRIPTION</u>	<u>Q'TY</u>	<u>DESIGNATION NO.</u>	<u>PART NO.</u>
WSH. 6 145-.250-.032	2	JIMH	0017-00104-0002
BRKT.-CONN. FIN.	1	"	0866-00118-00XF
INSULATED GND. STRAP	1	-	3000-17143-0700
8-32X5 SLOT PAN SCREW	1	-	0017-00101-0595
8-32 NUT HEX	1	-	0017-00103-0008
F.C.C. FILTER BD. SUPER PAC-MAN	1	A080-91476-A316	A080-91476-A316

REVISIONS

Bally / MIDWAY MFG. CO.

FRANKLIN

PROJECT ENG: L. DEKKER		USED ON SUPER PAC-MAN		PART NO M051 - 00316 - A026
DO NOT SCALE DOWN	HEAT TREAT	SCALE FULL	R-1 PER	
DIM. TOLERANCES UNLESS SPECIFIED		DRW. RLW	MAT'L	ASSEMBLY DRAWING F.C.C. FILTER BD. SUPER PAC-MAN A084-91476 - 316
DATE 02/08/83		CKD. <i>[Signature]</i>	FINISH	



NOTE:
ALL .01 CAPS ARE MF
ALL CAPS AX. CER. UNLESS
NOTED OTHERWISE
FB = FERRITE BEAD

PROJECT ENG'L. DEKKE

THIS DWG IS CONFIDENTIAL & PROPERTY OF MIDWAY MFG CO

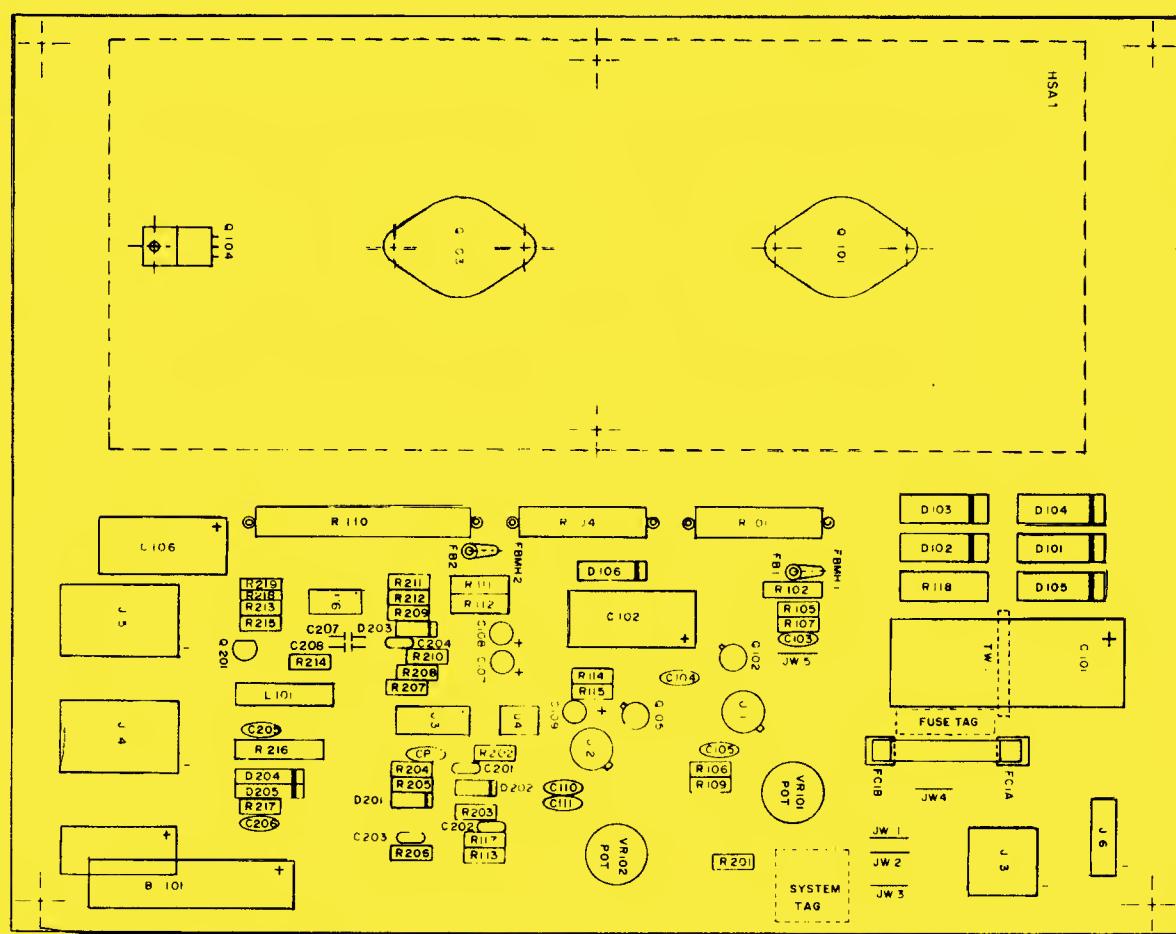
DIM. TOLERANCES		SUPER PAC-MAN		
UNLESS OTHERWISE SPEC				
CONCENTRICITY TIR		002		
FRACTIONAL	+ 1/64			
DECIMAL	$\pm .005$			
HOLE DIA	+ .002 .000			
ANGLE	$\pm 12^\circ$			
DO NOT SCALE DWG				
		RLW	06/19/8	FULL
ME	MM	INCH		
E.F.		N.M.		



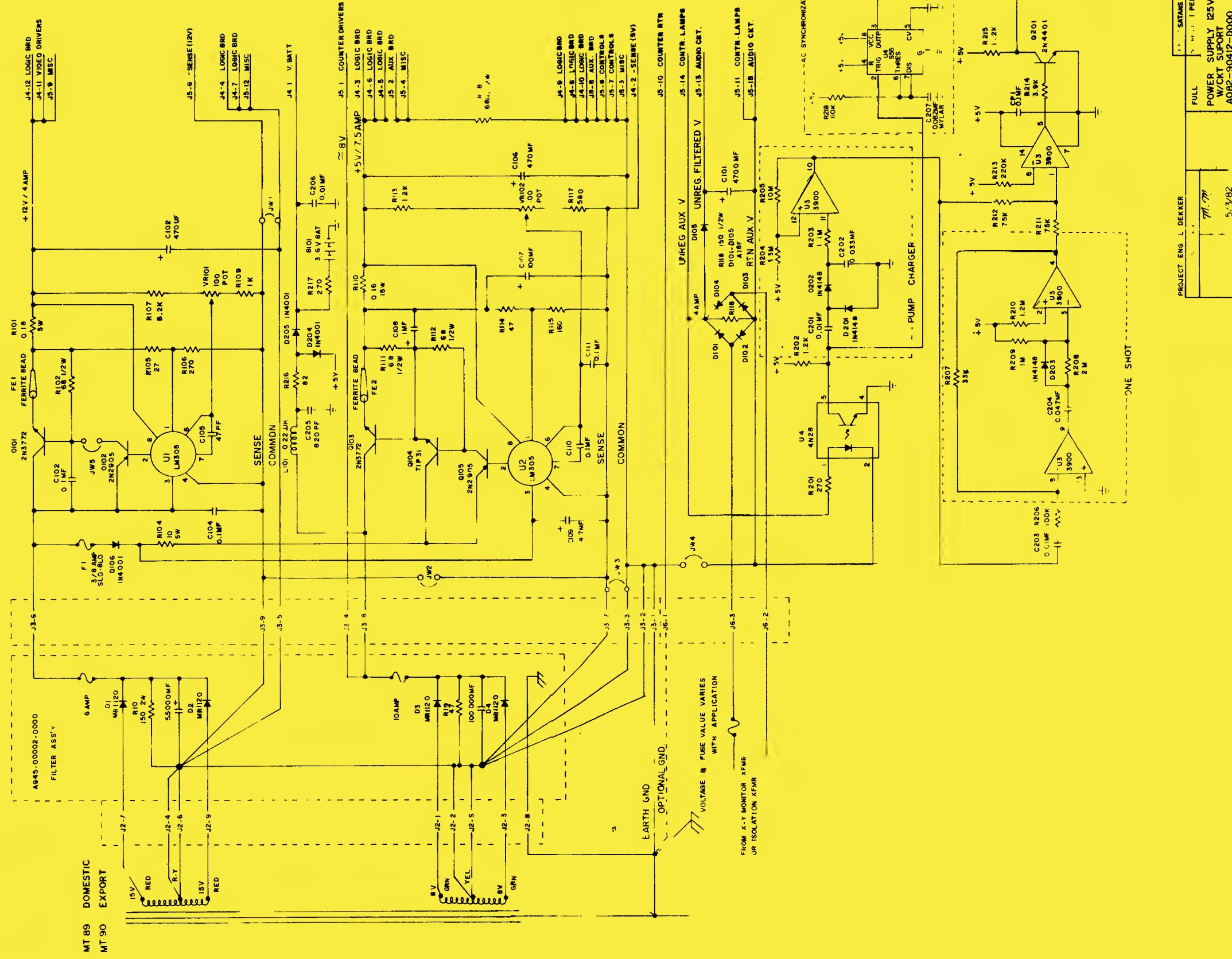
**SCHEMATIC
F.C. FILTER BD. SUPER PAC-MAN
A084 - 91476 - A316**

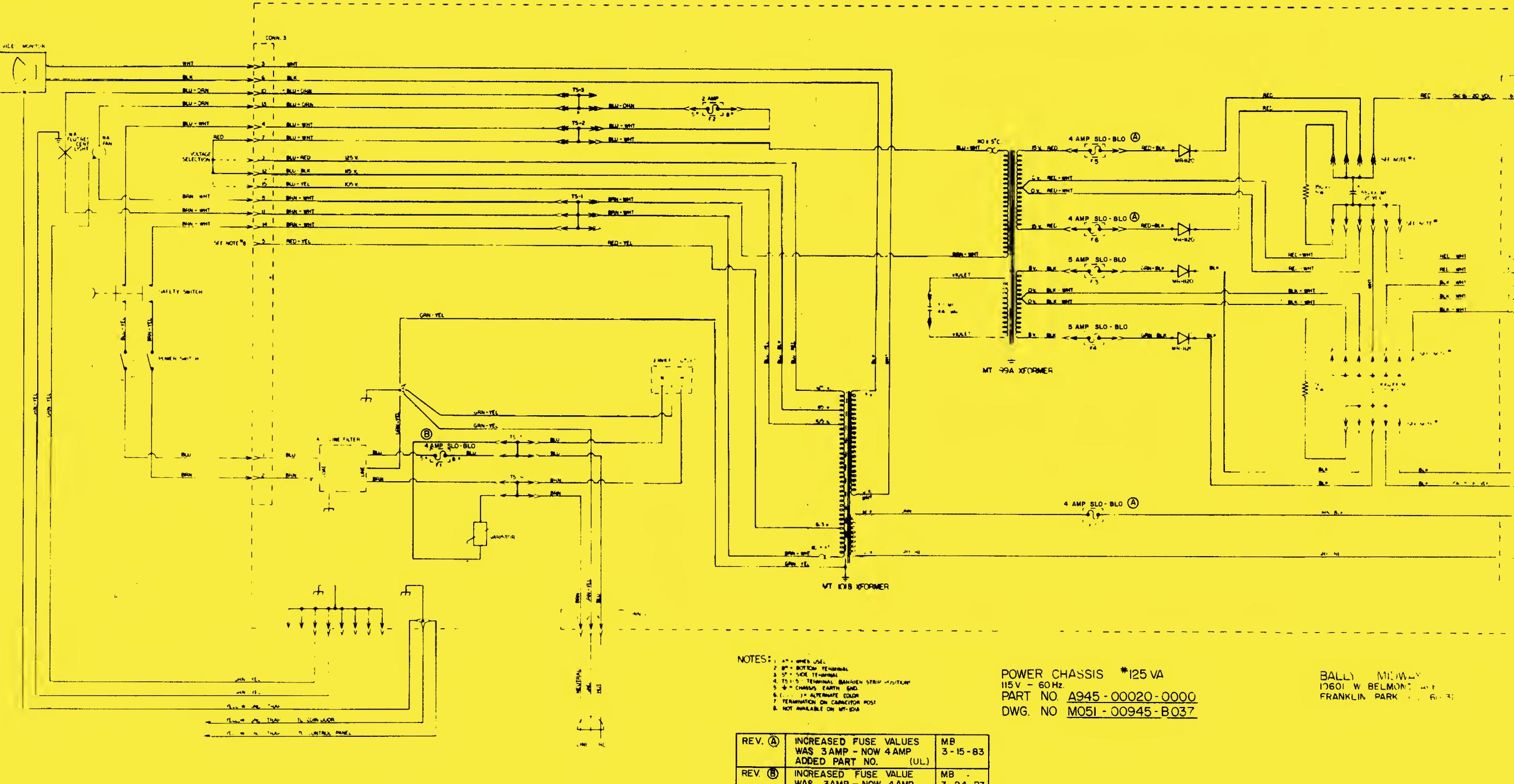
6/26 CORRECTED SCHEMATIC ERROR	
84	
REVISIONS	
PART NO	
MO51-00316-A027	

DESIGNATION *	DESCRIPTION	DESIGNATION *	DESCRIPTION	DESIGNATION *	DESCRIPTION	DESIGNATION	O'ty	DESIGNATION *	PART *	DESCRIPTION	O'ty	DESIGNATION *	PART *
C101	4700uF AX ELECT	R117	560ohm 1/4W 5%	U1	LM205 REG.	47pF AX. CER.	1	C105	0945-00811-0100	LM305 REG	2	U1,2	0945-00813-0100
C102	470uF AX ELECT	R118	1500ohm 2W	U2	LM305 REG.	820pF AX. CER.	1	C205	0945-00816-0400	555	1	U6	0929-00810-4500
C103	.1uF AX. CER.	R201	2700ohm 1/4W 5%	U3	LM3900	.01uF AX. CER.	2	C208,208	0945-00816-0100	LM3900	1	U3	0945-00813-0200
C104	.1uF AX. CER.	R202	1.2K 1/4W 5%	U4	4N28	.01uF MYLAR	2	C201,203	0945-00816-0200	4N28	1	U4	0945-00813-0300
C105	47pF AX. CER	R203	1.1M 1/4W 5%	U6	555	.033uF MYLAR	1	C202	0945-00816-0500				
C106	470uF AX. ELECT	R204	3.3M 1/4W 5%			.047uF MYLAR	1	C204	0945-00816-0300	A15F RECTIFIER	5	D101 '05	0945-00804-0200
C107	1uF RD. TANT.	R205	10M 1/4W 5%			0.082uF AX.CER	1	C207	0945-00816-1900				
C108	4.7uF RO. TANT	R206	100K 1/4W 5%	L101	22uH INDUCTOR	.1uF AX. CER.	5	C103,104,111	0945-00811-0200				
C109	.1uF AX. CER.	R207	33K 1/4W 5%			1uF RAD. TANT	1	C108	0945-00811-0300	IN4001	3	D106,204,205	0945-00804-0300
C110	.1uF AX. CER.	R208	2M 1/4W 5%			4.7uF RAO. TANT	1	C109	0945-00811-0400	IN4148	3	0201-203	0945-00804-0500
C111	.01uF MYLAR	R209	1M 1/4W 5%			100uF RAD. TANT	1	C107	0945-00811-0500				
C201	.033uF MYLAR	R210	1.2M 1/4W 5%			470uF AX. ELECT.	2	C102,106	0945-00816-0600	2N2905	2	Q102,105	0945-00808-0300
C202	.01uF MYLAR	R211	75K 1/4W 5%	8101	BATTERY 3.6VDC 60DEG C	470CJF AX. ELECT.	1	C101	0945-00811-0700	2N4401	1	Q201	0945-00804-0400
C203	.047uF MYLAR	R212	75K 1/4W 5%										
C204	.820pF AX. CER	R213	220K 1/4W 5%	F1	3.9A S BLO FUSE								
C205	.01uF AX. CER.	R214	3.9K 1/4W 5%										
C206	2.080	R215	1.2K 1/4W 5%										
C207	0.082uF MYLAR	R216	820hm 1W 10%	FC1A,1B	FUSE CLIP	160ohm 15W 5%	1	R110	0945-00815-0100	BATTERY 3.6VDC 60DEG C	1	B101	0017-00003-0377
		R217	2700hm 1/4W 5%			180ohm 5W 5%	1	R101	0945-00815-0200	FUSE 3/8A S BLO	1	FC1A,1B	0017-00003-0214
		R218	110K 1/4W 5%			0.8ohm 1/2W 5%	1	R111	0062-04703-1XXX	FUSE CLIP	2	TW1	0945-00814-0300
		R219	68ohm 1/2W 5%	FE1,2	FERRITE BEAD	10ohm 5W 5%	1	R104	0945-00812-0100	TIE WRAP	1		
						27ohm 1/4W 5%	1	R105	0062-06883-1XXX	FERRITE BEAD	2		
						47ohm 1/4W 5%	1	R114	0062-08683-1XXX	FERRITE MOUNTING HDW	2	FBM1,2	0017-00009-0225
						68ohm 1/2W 5%	3	R102,112,219	0062-09803-1XXX				0017-00033-0139
						82ohm 1W 10%	1	R216	0062-104F5-1XXX				
						150ohm 2W 5%	1	R118	0945-00812-0200	22uH INDUCTOR	1	L101	0945-00814-0200
CP1	1uF AX CER			J3	9PIN P.C. MOUNT CONN.(MALE)	160ohm 1/4W 5%	1	R115	0062-124B3-1XXX	FUSE TAG	1	M051	00945-A004
				J4	15PIN P.C. MOLNT CONN.(FEMALE)	270ohm 1/4W 5%	3	R106,201,217	0062-138B3-1XXX	SYSTEM TAG	1	M051	00945-A009
				J5	15PIN P.C. MOUNT CONN.(MALE)	560ohm 1/4W 5%	1	R117	0062-162B3-1XXX	P.C.B.	1	A080	90412-U000
R101	18ohm 5W W/RES SPACER	D102	A15F	J6	3PIN P.C. MOUNT CONN.(MALE)	1K 1/4W 5%	1	R109	0062-179B3-1XXX				
R102	68ohm 1/2W 5%	D103	A15F			1.2K 1/4W 5%	3	R113,202,215	0062-183B3-1XXX				
R104	10ohm 5W W/RES SPACER	D104	A15F			3.9K 1/4W 5%	1	R214	0062-207B3-1XXX				
R105	27ohm 1/4W 5%	D105	A15F	LB1	FUSE TAG	6.2K 1/4W 5%	1	R107	0062-217B3-1XXX				
R106	270ohm 1/4W 5%	D106	1N4001	LB2	SYSTEM TAG	33K 1/4W 5%	1	R207	0062-251B3-1XXX				
R107	6.2K 1/4W 5%	D201	1N4148			75K 1/4W 5%	2	R211,212	0062-269B3-1XXX	HEAT SINK ASS'Y	1	H5A1	A945-00008-0000
		D202	1N4148			100K 1/4W 5%	1	R206	0062-275B3-1XXX	(SEE H5 A55'Y DRAWING "XX NOTE")	1		
		D203	1N4148	HSA1	HEAT SINK ASS'Y 1	110K 1/4W 5%	1	R218	0062-277B3-1XXX				
		D204	1N4001	MHHSA1	MOUNTING HARD WARE(HEAT SINK)	220K 1/4W 5%	1	R213	0062-291B3-1XXX	4-40X10 5LT RNO	2	MH5A1A,2A	0017-00101-00727
		D205	1N4001		2 SCREW	1M 1/4W 5%	1	R209	0062-323B3-1XXX	4-40 HEX NUT	2	MH5A1E,2E	0017-00103-0002
					4 WASHER	1.2M 1/4W 5%	1	R203	0062-325B3-1XXX	W5H 4-120-.250-018	4	MH5A1B,10	0017-00104-0071
					2 HEXNUT	2M 1/4W 5%	1	R210	0062-327B3-1XXX	MH5A2B,20			
						3.3M 1/4W 5%	1	R205	0062-371B3-1XXX				
				JW1-5	JUMPER WIRE	10M 1/4W 5%	1			3PIN P.C. MOUNT CONN (MALE)	1	J6	0017-00021-0443
										9PIN P.C. MOUNT CONN (MALE)	1	J3	0017-00021-0425
										15PIN P.C. MOUNT CONN (FEMALE)	1	J4	0017-00021-044
										15PIN P.C. MOUNT CONN (MALE)	1	J5	0017-00021-0440
R109	1K 1/4W 5%	Q102	2N2905										
R110	16ohm 15W W/RES SPACER	O105	2N2905										
R111	6.8ohm 1/2W 5%	O201	2N4401										
R112	68ohm 1/2W 5%												
R113	1.2K 1/4W 5%												
R114	47ohm 1/4W 5%												
R115	160ohm 1/4W 5%												



PROJ. ENG'L. DEKKER	DD NOT CALDWELL	DATE 04/04/82	REV. 0
REVISIONS	ASSEMBLY DRAWING I25VA PWRSPY	FRANKLIN PK. ILL	MIDWAY MFG. CO.
NET TOLERANCE & ALLOWABLE	IN SOR	NO P/N	
MANUFACTURER	ASSEMBLY DRAWING I25VA PWRSPY	PART NO.	PART NO.
MANUFACTURE DATE	5/17/82	DATE	5/17/82
MANUFACTURE BY		MANUFACTURE BY	
MANUFACTURE ADDRESS		MANUFACTURE ADDRESS	
MANUFACTURE CITY		MANUFACTURE CITY	
MANUFACTURE STATE		MANUFACTURE STATE	
MANUFACTURE ZIP		MANUFACTURE ZIP	
MANUFACTURE COUNTRY		MANUFACTURE COUNTRY	
MANUFACTURE PHONE		MANUFACTURE PHONE	
MANUFACTURE FAX		MANUFACTURE FAX	
MANUFACTURE E-MAIL		MANUFACTURE E-MAIL	
MANUFACTURE WEBSITE		MANUFACTURE WEBSITE	
MANUFACTURE URL		MANUFACTURE URL	
MANUFACTURE ADDRESS		MANUFACTURE ADDRESS	
MANUFACTURE CITY		MANUFACTURE CITY	
MANUFACTURE STATE		MANUFACTURE STATE	
MANUFACTURE ZIP		MANUFACTURE ZIP	





BALLY/MIDWAY'S GAPLUS
U.R. #0A87
PROGRAMMED PART NUMBERS

UNPROGRAMMED LOGIC BD. A082-91741-BA87
PROGRAMMED GAPLUS LOGIC BD. A084-91741-BA87

POS.	MIDWAY PART NUMBER
8N	0A87-00803-0003
3E	0A87-00803-0004
3F	0A87-00803-0005
1D	0A87-00803-0006
2D	0A87-00803-0007
1C	0A87-00803-0008
4F	0A87-00803-0009
8G	0A87-00803-0010
7B0	0A87-00803-0011
9C1	0A87-00803-0012
9D2	0A87-00803-0013
9E3	0A87-00803-0014
9L4	0A87-00803-0015
6N5	0A87-00803-0016
6M6	0A87-00803-0017
6L	0A87-00803-0018
5N	0A87-00803-0019
5L	0A87-00803-0020
5M	0A87-00803-0021
5K	0A87-00803-0022

PRELIMINARY

6/29/84	RELEASE FOR PRODUCTION	

